

*Amendments to the Claims*

The listing of claims below will replace all prior versions and listings of claims in the present application.

*Claim Listing*

1-2. (Cancelled)

4-8. (Cancelled)

10-14. (Cancelled)

17. (Cancelled)

22-25. (Cancelled)

26. (New) A method for making an electrical-energy-storage unit comprising components fabricated by the method steps as follow:

- a) preparing a wet-chemical-prepared calcined composition-modified barium titanate powder derived from a solution of precursors:  $\text{Ba}(\text{NO}_3)_2$ ,  $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ ,  $\text{Nd}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ ,  $\text{Y}(\text{NO}_3)_3 \cdot 4\text{H}_2\text{O}$ ,  $\text{Mn}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$ ,  $\text{ZrO}(\text{NO}_3)_2$ , and  $[\text{CH}_3\text{CH}(\text{O})\text{COONH}_4]_2\text{Ti}(\text{OH})_2$  in deionized water heated to  $80^\circ\text{C}$ , and a separate solution of  $(\text{CH}_3)_4\text{NOH}$  made in deionized water and heated to  $80^\circ\text{--}85^\circ\text{C}$ , then mixing the solutions by pumping the heated ingredient streams simultaneously through a coaxial fluid mixer producing coprecipitated powder, then collecting the coprecipitated powder in a down-out vessel and refluxing at a temperature of  $90^\circ\text{--}95^\circ\text{C}$  for 12 hours, then filtering, washing with deionized-water, drying, and then calcining  $1050^\circ\text{C}$  in air;
- b) fabricating an aluminum oxide ( $\text{Al}_2\text{O}_3$ ) coating of  $100\text{ \AA}$  thickness onto the wet-chemical-prepared calcined composition-modified barium titanate powder, with the use of aluminum nitrate nonahydrate precursor applied

- 17 by wet chemical means, then calcining at 1050° C, resulting in a single-  
18 coated calcined composition-modified barium titanate powder;
- 19 c) fabricating onto the alumina-coated composition-modified barium titanate  
20 powder, a second uniform coating of 100 Å of calcium magnesium  
21 aluminosilicate glass derived from alcohol-soluble precursors: calcium  
22 methoxide or calcium isopropoxide, magnesium methoxide or magnesium  
23 ethoxide, aluminum ethoxide or aluminum isopropoxide, and tetraethyl  
24 orthosilicate are applied by wet chemical means which upon calcining at  
25 500° C results in a double-coated composition-modified barium titanate  
26 powder;
- 27 d) blending, this double-coated composition-modified barium titanate powder  
28 with a screen-printing ink containing appropriate plastic resins,  
29 surfactants, lubricants, and solvents to provide a suitable rheology for  
30 screen printing;
- 31 e) screen-printing into interleaved multilayers of alternating offset  
32 nickel electrode layers 12 and double-coated calcined composition-  
33 modified barium titanate high-relative-permittivity layers 11 with the use  
34 of screening inks having the proper rheology for each of the layers;
- 35 f) drying and cutting the screen-printed multilayer components 15 into  
36 a specified rectangular area;
- 37 g) sintering the screen-printed multilayer components 15, first at a temperature of  
38 350° C for a specified length of time, then at 850° C for a specified length  
39 of time, to form closed-pore porous ceramic bodies;
- 40 h) hot isostatically pressing the closed-pore porous ceramic bodies, at a  
41 temperature of 700° C with a specified pressure, into a void-free  
42 condition;
- 43 i) grinding and each side of the component to expose the alternating offset  
44 interleaved nickel electrodes 12;
- 45 j) connecting nickel side bars 14 to each side of the components 15, that have the  
46 interleaved and alternating offset nickel electrodes 12 exposed, by

- 47                   applying nickel ink with the proper rheology to each side and clamping the  
48                   combinations together;
- 49           k) heating the components and side nickel bar combination **14-15** at 800° C for a  
50                   time duration of 20 minutes to bond them together;
- 51           l) wave soldering each side of the conducting bars;
- 52           m) assembling the components **15** with the connected nickel side bars **14** into the  
53                   first array, utilizing unique tooling and solder-bump technology;
- 54           n) assembling the first arrays into the second array; and
- 55           o) assembling the second arrays into the EESU final assembly.

1           27. (New) The method of claim 26 wherein a second coating of glass is  
2           provided onto the double-coated composition-modified barium titanate powder being in  
3           contact with the nickel electrodes and having an applied working voltage of 3500 V  
4           across the parallel electrodes.

1           28. (New) The method of claim 26 wherein a dielectric voltage breakdown  
2           strength of  $5.0 \times 10^6$  V/cm is achieved across the electrodes of the components.

1           29. (New) The method of claim 26 wherein the method provides an ease of  
2           manufacturing due to the softening temperature of the calcium magnesium  
3           aluminosilicate glass allowing the relatively low hot-isostatic-pressing temperatures of  
4           700° C which in turn provides a void-free ceramic body.

1           30. (New) The method of claim 26 wherein the method provides an ease of  
2           fabrication due to the softening temperature of the calcium magnesium aluminosilicate  
3           glass allowing the relatively low hot-isostatic-pressing temperatures of 700° C which in turn  
4           allows the use of nickel for the conduction-path electrodes rather than expensive platinum,  
5           palladium, or palladium-silver alloy.

1           31. (New) The method of claim 26 wherein the method provides an ease of  
2           fabrication due to the softening temperature of the calcium magnesium aluminosilicate  
3           glass allowing the relatively low hot-isostatic-pressing temperatures of 700° C, which feature

4 along with the coating method provided a uniform-thickness shell of the calcium  
5 magnesium aluminosilicate glass and in turn provides hot-isostatic-pressed double-coated  
6 composition-modified barium titanate high-relative-permittivity layers that are uniform and  
7 homogeneous in microstructure.

1 32. (New) The method of claim 26 wherein the method provides the double  
2 coating of the basis particles of the composition-modified barium titanate powder thereby  
3 reducing the leakage and aging of this material by an order of magnitude of the  
4 specification of this basis material, thus reducing the discharge rate to 0.1% per 30 days.

1 33. (New) The method of claim 26 wherein the method provides a double coating  
2 of the composition-modified barium titanate powder, the hot-isostatic-pressing process, the  
3 high-density solder-bump packaging, and along with the double-layered array configuration  
4 store 52,220 W·h of electrical energy in a 2005 inches<sup>3</sup> container.

1 34. (New) The method of claim 26 wherein the method provides materials used:  
2 water-soluble precursors of barium (Ba), calcium (Ca), titanium (Ti), zirconium (Zr),  
3 manganese (Mn), yttrium (Y), neodymium (Nd), forming the composition-modified  
4 barium titanate powder, and the metals: nickel (Ni), and copper (Cu), which are not  
5 explosive, corrosive, or hazardous.

1 35. (New) The method of claim 26 wherein the method provides an EESU that is  
2 not explosive, corrosive, or hazardous and therefore is a safe product when used in  
3 electrical vehicles, which include bicycles, tractors, buses, cars, or any device used for  
4 transportation or to perform work.

1 36. (New) The method of claim 26 wherein the method provides an EESU which  
2 can store electrical energy generated from solar voltaic cells or other alternative sources  
3 for residential, commercial, or industrial applications.

1 37. (New) The method of claim 26 wherein the method provides an EESU which  
2 can store electrical energy from the present utility grid during the night when the demand

3 for electrical power is low and then deliver the electrical energy during the peak power  
4 demand times and thus provide an effective power averaging function.

1 38. (New) The method of claim 26 wherein the method provides a double  
2 coating of the composition-modified barium titanate powder and a hot-isostatic-pressing  
3 process which together assists in allowing an applied voltage of 3500 V to a dielectric  
4 thickness of  $12.76 \times 10^{-6}$  m to be achieved.

1 39. (New) The method of claim 26 wherein the method provides an EESU which  
2 when fully discharged and recharged, the EESU's initial specifications are not degraded.

1 40. (New) The method of claim 26 wherein the method provides an EESU which  
2 can be safely charged to 3500 V and stored at least 52.22 kW•h of electrical energy.

1 41. (New) The method of claim 26 wherein the method provides an EESU that  
2 has a total capacitance of at least 31 F.

1 42. (New) The method of claim 26 wherein the method provides an EESU that  
2 can be rapidly charged without damaging the material or reducing its life.